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BY

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THE EXPEDITION OF THE "ALERT" TO HUDSON'S STRAIT AND BAY IN 1885.

By JAMES MACNAUGHTON, A. M., M. Am. Soc. C. E., etc.

[Read before the Albany Institute, April 6, 1886.]

In order that the objects, the scope, and the causes which led to the expedition of the "Alert" to Hudson's Bay, may be fully understood, a brief consideration of a few historical facts appears to be essential.

Hudson's Bay was discovered by Henry Hudson in 1610. He sailed through the Strait which bears his name in June, or July, of that year, in search of a north-west passage to the Pacific Ocean.

Arrived in the Bay, he found himself in a *cul-de-sac*, and could go no further westward with his ship. He resolved to remain there during the winter and to resume explorations the following spring.

His provisions ran short, however, and he was compelled to return to England. It is said that he incautiously declared to his men that, in their destitute condition, he would be obliged to leave some of the crew behind. The latter, with an independence and alacrity which no doubt astonished the bluff old navigator, hustled him, his son, and several of their number who remained loyal to their brave captain, into an open boat and abandoned them to their fate, which to this day is unknown. The remainder of the crew, totally ignorant of the science of navigation, managed to sail the ship as far as Cape Wolstenholme, or somewhere in that neighborhood. Here they went ashore for water and game, but were tendered a warm reception by a band of Eskimos, who butchered nearly half of the crew. The survivors escaped to the ship, and managed to blunder along till they reached England.

As we who live on the shores of Hudson's River are naturally interested in every thing pertaining to the fate of Henry Hudson, I may say that it is not of necessity to be inferred that he and his men, who were abandoned in the Bay, starved to death. It is quite reasonable to suppose that they reached the shore of the Bay in safety and made friends with some of the native tribes. The region abounded in game, and we may be sure that the tact, ability, and courage of the leader proved equal to the task of preventing a massacre of the little party by the natives.

Very likely the crafty old sailor managed to persuade the Indians or Eskimos, with whom his lot was cast, that he was a great "medicine-man." With his knowledge of astronomy and the natural sciences, it would have been easy for him to impose upon these credulous and confiding people, who would, on account of his acquirements and seemingly supernatural powers, have looked upon him as a being of divine and sacred origin. Quite likely he settled down to a life of ease and luxury,—from an Eskimo point of view,—married a select assortment of chiefs' daughters, and became the father of numerous chubby, long-haired children. Possibly, he became a great hunter and a renowned chief. Certain it is that, if his life was spared, his fearless and active master-mind must have made him a prominent man among those savage peoples.

Whether his fate was like the one I have outlined or not, I was accustomed to amuse myself last summer by speculating on the possibility, when I met any of the natives on the shores of the Bay, of their being descendants of Hudson; whether I should not address them as Mr. and Mrs. Hudson, the Misses Hudson, etc. It was awe inspiring to one brought up to regard with respect the blue blood of bi-centennial Albany, to think that these not altogether attractive-looking people were the descendants of the man who discovered the river which made Albany possible, and who was famous before the first Knickerbocker of this city baked his marbles or fried his indigestible oley-kocks. It was something of a shock, however, to see the possible Mr. and Mrs. Hudson devouring, with great relish, a hearty meal of raw bear's meat, more indigestible, one would think, than either the marbles or the oley-kocks; or to see the potential Hudson children with their mouths full of feathers, which indicated that their animal economy was in process of absorbing the flesh of the birds which those feathers had formerly adorned.

Little more was heard of Hudson's Bay, after Hudson's last voyage, until 1662, when Desgroseillers is said to have sailed into it.

Couture and Duquet took possession the following year in the name of the King of France; in 1668, Radisson, a Frenchman, and Gillam, an Englishman, from New England, built a trading fort, and, lastly, in 1670, came the first establishment of the Hudson's Bay Company. From that date until the treaty of Utrecht, in 1713, the Bay became the theater of sanguinary conflicts; many a hero there won fame for deeds renowned in story; the navies of England and France made it the field of many a fight, and the forts on its shores were time and again taken and retaken; so that Iberville, writing to the King, said,

"*Sire, je suis las de conquérir la Baie.*" The law of the survival of the fittest was illustrated there as elsewhere in nature. The great English company founded by Prince Rupert, the Duke of Albemarle, the Earl of Craven, and others, emerged from these conflicts, triumphant and victorious.

From 1670 to 1870, the Hudson's Bay Company, originally incorporated under a grant from Charles II., held almost sovereign powers in the region of Hudson's Bay, and for many years, of the region lying between the Bay and the Pacific Ocean. Immense fortunes had been made for its stockholders in that time. This corporation has had the most remarkable history of any on record. Like other corporations, it has had no soul. Possessing in its own territory the power of life and death over its subjects, it has ruled with a rod of iron. It was ever ready, with the inborn pugnacity of an English company, to take up arms against all intruders. The poor traders, whom it could drive out by brute force, were unceremoniously kicked about, maltreated and robbed by the Indian allies of the company and, undoubtedly, at the company's instigation. Competitors, who were too powerful to be bullied, were absorbed into this giant concern. The policy of the company was always to keep the public in the dark as to this region. It spread the most absurd reports as to the awful dangers of navigation in that region; of fearful sufferings from cold, from tempests, from wild beasts, of the savage cruelty and diabolical propensities of the wilder natives. It represented Hudson's Strait to be the gateway to an inland sea of wretchedness, misery, desolation and poverty, and that all who were bold enough to attempt an entrance should leave hope behind. Yet all this time the company was paying large dividends on copiously watered stock.

This great company opposed any attempt to improve the condition of the miserable natives, the Indians and Eskimos. Would-be missionaries were fired out of the country with such vim that they did not care to return.

"A Christianized Indian is a lazy Indian, and we will not have them. Teach them to pray, to sing hymns, to go to church, and you ruin them for hunters and trappers." This was the theory of the Hudson's Bay Company."

The great aim and sole purpose of the Hudson's Bay Company have been to make money for its stockholders. Its affairs have been managed by men of shrewd business tact and acumen. Never was a company more faithfully served by its officers and employes. Every officer,

every factor, every clerk, is either an actual, or a prospective, stockholder. The hardships endured, the risks to life and health encountered, the pluck and devotion displayed by the young men employed by this company, make a record the most remarkable in the history of corporations. The inducements were great and promotion for merit was assured.

In pleasing contrast to the greedy, grasping, and oftentimes unprincipled actions of this great company, stands the fact that they have always kept, strictly, agreements made with their men and have never, I believe, broken a pledge made to the natives. Furthermore, they have never permitted intoxicating liquors to be given in trade to the natives. Their rule over these poor people, although stern and uncompromising, has been uniform and characterized by good faith.

In 1870, the Canadian Government acquired by purchase most of the territory and jurisdiction of the Hudson's Bay Company, the latter reserving only a certain amount of land. So that now this Hudson's Bay region is open to all Canada for settlement, trade, or commerce, and the reign of the giant monopoly is at an end.

As long ago as 1812, attention was called to the importance of the Hudson's Bay route — so-called — as a line for commerce between the Pacific Ocean and Europe, and between the north-western provinces of Canada and England.

In 1848, Colonel M. H. Synge (then Lieutenant) of the British army, published a small work on Canada, in which he suggested that this might become in the future a route for commerce of great importance. In 1864, Prof. Hind favored it in a paper which he read before the Statistical Society of Canada.

In 1878, Dr. Robert Bell, F. R. S., Assistant Director of the Geological Survey of Canada, wrote an account of this route for the Minister of the Interior Department of the Canadian Government. In 1881, the same gentleman presented a paper to the Royal Geographical Society, in which he discussed in a masterly manner the commercial importance of Hudson's Bay.

By these and other means public attention in Canada has been called to the great importance of this Hudson's Bay route — if practicable — not only as affording a quick and cheap outlet for the products of north-western Canada, but also as a short and economical route between Japan and England.

If we assume that the navigation of Hudson's Strait and Bay is possible for a long enough time each year for the purposes of commerce, the immense importance of this line becomes manifest on reflection.

The so-called Hudson's Bay route consists of a railway connecting Port Simpson, on the Pacific, with Ft. Churchill, on the west coast of Hudson's Bay, and a line of ocean steamers plying between the latter port and Liverpool. The distance from Port Simpson, in British Columbia, to Ft. Churchill by the proposed railroad is 1,450 statute miles, and the distance by water from Ft. Churchill to Liverpool is 2,960 nautical miles. In other words, with a haul of only 1,450 miles by rail, freight from the Pacific can be delivered by this route nearer to Liverpool than is either Montreal or New York. Let me say, in passing, that there is little doubt as to the practicability of building and operating the proposed railway.

If we take Yokohama, a central point in Japan, and Liverpool, the great commercial center of Europe, it will be an easy matter to find the shortest distance between the two on some of the existing routes, and this proposed one.

LINE NO. 1, VIA CENTRAL AND UNION PACIFIC RAILWAYS.

	Statute miles.
Yokohama to San Francisco.....	5,140
San Francisco to New York.....	3,390
New York to Liverpool.....	3,496
Total railway and navigation.....	<u>12,026</u>

LINE NO. 2, VIA CANADIAN PACIFIC RAILWAY.

	Statute miles.
Yokohama to Port Moody.....	5,030
Port Moody to Montreal.....	2,885
Montreal to Liverpool.....	3,450
Total railway and navigation.....	<u>11,365</u>

LINE NO. 3, VIA HUDSON'S BAY ROUTE.

	Statute miles.
Yokohama to Port Simpson, B. C.....	4,444
Port Simpson to Churchill.....	1,450
Churchill to Liverpool.....	3,404
Total railway and navigation.....	<u>9,298</u>

Difference in favor of No. 2 over No. 1..... 661 statute miles.

Difference in favor of No. 3 over No. 1..... 2,728 statute miles.

Difference in favor of No. 3 over No. 2..... 2,067 statute miles.

Compare particularly the saving in *railway distance* by the Hudson's Bay line. The saving as compared with Union and Central Pacific Railways is 1,940 miles; as compared with the Canadian Pacific Railway, is 1,435 miles.

There is still another advantage which the Hudson's Bay route possesses over the other two. The highest point of the railway, on that line, would be only about 2,350 feet above sea level, nearly 1,000 feet lower than the highest point on the Canadian Pacific Railway, and 5,800 feet — more than a mile — lower than the highest point on the Union Pacific Railway.

Assuming, as I have said, that this line is a practicable one, it would prove of incalculable benefit to Manitoba and the north-western provinces of Canada. These districts are now almost shut out from the markets of the world on account of the long railway haul, which is now an essential function in the marketing of their products. Their wheat, their cattle, their lumber, must now be transported over the Canadian Pacific Railway, which has no competitor in that region. So bitter and intense is the feeling in many places in these districts, on account of the seclusion, that threats are frequently made by prominent men, of organizing a movement of secession from the Canadian confederation and of joining the United States. In fact the confederation has been of very little benefit to any of the provinces except Ontario and Quebec. Manitoba, the north-western territories and the maritime provinces have derived very little advantage from the union, and the Government has been obliged, in various ways, to yield to the demands of these provinces in order to keep the peace.

The expeditions of 1884 and 1885, which the Canadian Government sent out to Hudson's Bay, were organized principally at the urgent entreaty, I might say almost imperative demands, of the north-western provinces.

A select committee of the House of Commons was appointed at the session of Parliament, in 1884, to inquire into the navigation of Hudson's Bay. They had full power to send for persons and papers, and they made an exhaustive study of the problem. They were so convinced of the importance and practicability of the project, that they submitted a report to the House, in April of that year, in which they recommended that a surveying and exploring expedition be sent to Hudson's Strait and Bay; that stations be established at important places in the Strait where meteorological and magnetic observations should be made, various physical phenomena studied, such as the currents, temperature of waters, the tides, the movements and nature of

the ice masses, hydrographical bearings, etc.; that notes be taken as to the dates of forming and breaking up of ice in various rivers on the shores of the Bay; that collections of minerals and rocks be made, in order to throw light upon the geology of the country; and that notes be taken of the value and importance of the various fisheries and of the fur trade.

In brief, the object of these expeditions was primarily to ascertain the practicability, or otherwise, of the Hudson's Bay route, and to learn, in addition, as much as possible about the resources and products of that vast territory, which had long been a *terra incognita* to the general public. It was decided that the observing stations should be continued for three years at least.

In the summer of 1884 an expedition was, therefore, sent to Hudson's Strait and Bay and seven observing stations were established.

After the houses at the various posts had been built, and the men had been assigned to their positions, the ship which had taken them out returned to Halifax, with the remainder of the expedition, in October of that year.

The expedition of 1885, of which I was a member, started in the latter part of May, the plan being that the vessel which carried the party should be off the entrance to Hudson's Strait soon after June 1, so as to be able to take advantage of the earliest opportunity of running into Hudson's Bay whenever the ice should open up sufficiently to permit of our entrance.

I hope I have not wearied you by too much preliminary matter, but it seemed to me essential, in order that you might grasp the importance of the mission on which our expedition had been sent, that these preliminary data be presented to you.

You will thus see that this expedition was not a utopian one to hunt for the North Pole—as some people seem to imagine—and was not an arctic expedition *per se*, although at times our experiences partook of an arctic flavor.

The various members of the expedition were ordered to report to Lieut. A. R. Gordon, R. N., at Halifax, on May 25, 1885.

The expedition was under the immediate command of Lieut. Gordon, who is now the Assistant Director of the Meteorological Bureau of Canada. Most of the cabin passengers on the ship were officers of the same branch. In addition to these were Dr. Robert Bell, F. R. S., Assistant Director of the Geological Survey of Canada, and myself, who was also an appointee of that department. Our party in the ward-room of the ship was composed of ten individuals. We had, in addi-

tion, forty-two men, comprising the petty officers, crew and station men. The ship in which we passed five long months was H. B. M. s. s. "Alert," which had been given to the United States by the British Government, to aid in the relief expedition which rescued Lieut. Greely and his unfortunate party. After its return from that expedition, the American Government gave it back to the British, with grateful expressions of thanks for the international courtesy. The "Alert" is also famous for having penetrated the furthest northward of any vessel in history, when she was under the command of Sir George Nares, in 1876, on the arctic expedition of which he was commander.

Our table-ware in the ward-room was a substantial reminder of the good feeling and comity existing between Great Britain and the United States. The china displayed the naval crown of the British Empire, while the silver and glass bore the monogram of the United States navy.

They seemed to be mute memorials of a family quarrel which was a thing of the past and of bitterness forgotten, pledges that the two great English-speaking nations of the world were willing to work shoulder to shoulder in the cause of civilization, of science, of progress and of humanity.

At 11 A. M. on Wednesday, May 27, the hawsers were cast off and the "Alert" left the wharf at Halifax on her northern cruise.

The day was bright and pleasant. The entire ward-room contingent passed most of the afternoon on or near the ship's bridge, with the laudable purpose of getting acquainted with one another. Captain Gordon and Dr. Bell I had met before; of the others, Mr. Beaton was the only representative of the press on board, Mr. Barry was the first officer, while Messrs. Payn, Woodworth, Tyrrel, Mackenzie and Shaw were officers of the Meteorological Department. These five latter gentlemen were sent out to relieve others of the same service who, as already explained, had been left at various points in Hudson's Strait a year previous, and who will remain for a year in that region. Each one is to have charge of a station with only two men—generally laboring men—as companions. They are separated many miles, and in that long time will see no human beings save Eskimos. Their duties are to make the regular meteorological and other observations.

The printed instructions given them by Captain Gordon, soon after they came on board, read as follows :

INSTRUCTIONS TO OFFICERS IN CHARGE OF STATIONS IN HUDSON'S BAY AND STRAITS.

"As the primary object of the whole expedition is to ascertain for what period of the year the Straits are navigable, all attention is to be paid to the formation, breaking up, and movements of the ice.

"Each station is supplied with a sun dial and time piece, and the clock is to be tested each day when there is sunshine about noon. A table of corrections is supplied for the reduction of apparent time to local mean time, to this the difference of time will be applied to 75th meridian, all entries being made in the time of this meridian, and observations will be taken regularly at the following times throughout the year, viz.: 3h. 8m., 7h. 8m., 11h. 8m., A. M. and P. M.

"Each morning the sums and means of the observations taken on the previous day will be taken out and checked over, they will then be entered in the abstract books supplied for the purpose.

"After each observation during daylight, the observer on duty will take the telescope and carefully examine the Straits, writing down *at the time* all that he sees, stating direction and (when possible) velocity of tide, movement of ice, if any, also describe the condition of the ice, whether much broken up, solid field, etc., etc.

"*Tidal observations.*—Each day the time and height of high and low water is to be carefully observed, and during the open season the character of the tide will be carefully noted for two days before and three days after the full and change of the moon. For this purpose a post marked off in feet and fractions of a foot is to be placed in the water, at low water in some sheltered spot, if any such be available, and the height of the water noted every half hour during the rise and fall of one tide on each of these days—the height to be noted most carefully every five minutes during the hour of high water, and the same at low water—the five minute observations will also be taken for one hour during the most rapid portion of the rise. Special observations of barometric pressure are to be taken in connection with these tidal observations.

"To check the zero mark for the tidal observation post, select a spot on shore from which the horizon line will be projected on the tidal post, and record the reading of this line when seen projected on the post by the observer, whose eye is to be placed at a measured height above the datum point selected on shore.

"All remarks in regard to the movements of birds, fish, etc., and also as to the growth of grasses, will be carefully entered.

"As it is impossible to give to the officers in charge of stations detailed instructions which would be of service in every contingency which might arise, the officers are required to observe and enforce the following rules:

"(a.) Every possible precaution is to be taken against fire, and as it is anticipated that the temperature can be maintained considerably

above the freezing point inside the houses, two buckets full of water are always to be kept ready for instant use.

“(b.) As the successful carrying out of the observations will, in a great measure, depend on the health of the party, the need of exercise is strongly insisted on during the winter months, and also that each member of the party shall partake freely of the lime juice supplied.

“(c.) Each party is supplied with a boat, but unless some emergency required it, it must be a rule that neither afloat nor ashore must any of the party leave the station for a greater distance than they can be sure of being able to return the same day.

“(d.) As soon as possible after the houses are completed and the stores all in place, the party will set to work collecting sods, grass or any other non-conducting material, and before the winter sets in the whole house is to be covered with this, boards overlaid and snow packed over all; the assistance of the Eskimos should, if possible, be obtained, and the whole house arched over with snow.

“ANDREW R. GORDON,

“Lieutenant R. N., Commanding Expedition.”

“OTTAWA, 5th July, 1884.”

After leaving Halifax harbor, we stood out to the south-eastward and then altered course to east by north, thence we passed between Cape Breton Island and Newfoundland into the Gulf of St. Lawrence. Our first stopping place was Blanc Sablon, in Labrador, where we laid in an additional supply of coal. From Blanc Sablon, we passed up through the Strait of Belle Isle into the waters of the broad Atlantic.

Almost immediately after passing Belle Isle, we met the ice pack which was coming down the coast. The entire Labrador coast from that point to Hudson's Strait, and away north, was lined with a pack varying in width from thirty-five to one hundred miles. We were obliged to shape our course to the eastward and then to skirt along the edge of the ice pack.

In the early morning of June 13, we spoke the whaling-barque, “Maude of Dundee,” Scotland, Captain Watson in command. He came on board the “Alert,” and stated that he had arrived abreast of the entrance of Hudson's Strait about April 1. At that date there were over one hundred and twenty miles of ice between him and the shore. From that date, until the day of our meeting, the “Maude” had been cruising off the edge of the pack between Lady Franklin Island and latitude fifty-nine degrees north. Captain Watson was unable at any time to get nearer than thirty-five miles to Resolution Island—at the entrance to Hudson's Strait.

This would indicate that the stream of Davis' Strait ice had been flowing, without interruption, through the months of April, May and

the first half of June, across the entrance to Hudson's Strait. This, of course, would have proved an impenetrable barrier, during that time, to any ship desiring to run into Hudson's Bay, even if the ice in the Strait itself had been loose enough to work through.

Most of this ice, which closed the door to Hudson's Bay, was of the heavy arctic variety and had come many miles from the northward. Some of it was over forty feet in thickness of solid blue ice, not field ice which had been thickened by the piling of pan upon pan, but a solid sheet of ice which had frozen just as we saw it. How long this ice had been in process of formation it is difficult to judge. The depth to which water will freeze has, so far as I know, never been determined, but it is certain that ice, being a very poor conductor of heat, when once a certain thickness of it has formed, the rate of thickening will be very slow.

Lieut. Ray, of the United States Signal Service, gives as a result of his observations at Point Barrow, in the Arctic, that the greatest thickness of ice formed in one season was six feet two inches.

Early on the morning of June 16 we made the land, Cape Best on Resolution Island, distant about ten miles off the starboard bow, but the ice having run together the engines were stopped. We were in the midst of heavy field ice tightly jammed. With the exception of Resolution Island, which is a bleak, barren and desolate looking island with rocky and bold shores, nothing was to be seen except ice all around us. As the event proved we were destined to remain in this icy trap for three long, monotonous weeks, drifting about helplessly with the ice pack, without volition on our part;

"In thrilling regions of thick-ribbed ice
To be imprisoned in the viewless winds,
And blown with restless violence about
The pendent world."

During the three long weeks in which we were beset in the ice, time hung heavily on our hands, although we all had some daily duties to perform. Occasionally we would get a shot at a murre or a gull, or if the ice opened up a little, a shot at a seal. After living for some time on salt meat, a delicacy like curried gull, or seal pie, or broiled seal flipper was highly appreciated. For amusement and exercise we were obliged to content ourselves with pitching rope quoits on deck, walking over the ice, or when a particularly large ice pan was near the ship, by a game of "rounders." Those who, like myself, belonged to the great order of land lubbers would make vain attempts to imitate the sailors

in climbing about the rigging and to impress the crew with the idea that we were old hands at it.

But in spite of the occasional tedium of our monotonous life there was much to interest one who had never been in arctic regions before. At times one would be impressed with the supernatural tinge which the surroundings would give. Every thing seemed odd and the world upside down and chaos come again, where nothing was to be seen but ice — ice everywhere except where the black rocks of Resolution Island broke the surface. On the evening of June 21, the longest day of the year, I remained a long time on deck. It was bright, clear and cold, the thermometer at eight P. M. registering thirty-one degrees. In that region the variation of the magnetic needle is very great, being greatly west of true north. Sunset occurred about ten P. M. on that evening. It was difficult almost to convince myself, knowing the time of night, that I was not dreaming. And, strangest of all, the sun was setting about north by compass. It was a weird, eerie, impressive scene. It almost seemed that the sun had strayed so far from its course that it would wander off into some infinitude of space and never return. Soon after it disappeared behind the ice, as if conquered by obstinate frigidity, the still arctic twilight shed its pale light about. Clouds, like a funeral pall, hung over the grave of the extinct sun. Solemn, mysterious, gigantic icebergs moved slowly along, carried onward by hidden currents which were powerless on the surface. This ghostly procession passed in review while our little ship lay motionless in icy fetters. Resolution Island, black, forbidding, looked like the evil genius of this strange scene. Later on the moon rose and filtered pale, flickering rays through the clouds which, mixed with the peculiar arctic glow, made the most singular and supernatural light I have ever seen.

Long after midnight — or what would have been midnight in this latitude — I went below and turned in to my berth, which was just below the water line. Until I fell asleep, I could hear the ice grating along the ship's side, with an ominous sound. Then would come a loud rap, as if some ghostly and restless denizen of these weird regions resented sleep on the part of mortals. Again, as we were caught in a tight ice nip, the old ship's timbers would groan as if in mortal agony. We seemed beset on all sides by unseen enemies. Away from the ship's deck, not a living creature was to be seen. It seemed

"A universe of death; which God by curse
Created evil, for evil only good,
Where all life dies, death lives and nature breeds,

Perverse, all monstrous, all prodigious things,
Abominable, inutterable, and worse
Than fables yet have feigned, or fear conceived,
Gorgons, and Hydras and Chimeras dire."

In the sharp contest with the ice, which was without doubt unusually heavy last season, our ship was very badly damaged. Her iron stem-plate was wrenched completely off, the chafing plates on her bows were partially pulled out and the timbers underneath somewhat damaged. Under these conditions, and as there was little prospect of getting into Hudson's Strait for some time, Captain Gordon wisely decided to put about and to run down to St. Johns, Newfoundland, and repair the ship.

This was accordingly done, and we did not return to the entrance to Hudson's Strait until August 3. On the morning of this day, we were off Cape Chudleigh, after having steamed through heavy ice all the night before. On this morning we were still in the ice, although there was open water near the land. Before reaching it, however, the tide changed, and the tidal current of six knots per hour ran the ice together against the ship, and carried ice, ship, and every thing floating out to sea.

In the afternoon, a heavy fog shut down, and at ten P. M. the engines were stopped and we lay to for the night.

On the following day, at about three P. M., after another struggle with the ice and tidal currents, we rounded Cape Chudleigh and dropped anchor in the harbor of Port Burwell, where one of the stations was established the previous year. We were obliged to walk ashore, about an eighth of a mile, over the ice, as the latter had run closely together soon after we had dropped anchor.

Mr. Burwell, the officer in charge of the station, and his two men were found to be quite well. They reported that they had had no sickness during the year, and that they had not suffered unduly from the cold, although the thermometer had indicated during the winter a temperature at times 40° below zero.

On some winter days the wind blew with fearful violence. One day the anemometer registered a speed of eighty-four miles per hour, when the instrument was blown down. Subsequently, the wind appeared to increase in velocity. It slightly raised the frame house several times. The inmates feared it would be blown over altogether and they put out the fire in the stove for fear of disaster. One of the station-men and an Eskimo started out of doors for some purpose, when the wind suddenly caught them, threw them off their feet, and hurled

them into a snow-drift twenty feet distant. In order to return, they were obliged to crawl on their hands and knees. The station-houses, of which the one at Port Burwell is a type, are frame dwellings, strongly built, having two thicknesses of boarding and the interstices filled with felt and moss. The inner part of the roof is lined with felt, and the same material is placed under the floor, while heavy canvas is used in lieu of carpets. Outside the house stone walls are built, and the space between the walls and the house filled in so as to prevent, as far as possible, the wind from getting underneath the house and so overturning it.

The house is divided into three rooms, one the general sitting-room, kitchen and eating-room, one bedroom for the officer in charge and one for his two men. A large cooking stove, in which hard coal is burned, heats the building. Even with the low temperatures of winter, the men had little difficulty in keeping the temperature in-doors up to 65° and 70° Fahr.

At these stations a plentiful supply of provisions, sufficient to last two years, had been left. It consisted of salt beef, salt pork, canned meats, evaporated fruits and vegetables, biscuits, flour, oatmeal, tea, coffee, sugar, condiments, etc., and plenty of lime juice; a considerable supply of tobacco was furnished, also a good and well-selected supply of medicines, which included two bottles of brandy, which was all the liquor permitted to be taken ashore.

At all of the stations, where the instructions as regards care of health, including those relating to diet, exercise and cheerful occupations, were followed, the health of the men was excellent. One man died of scurvy, but the result was clearly his own fault. He refused to drink lime juice, would not vary his diet nor take sufficient exercise and, consequently, died of a disease which is considered preventable.

On Wednesday, August 5, we left Port Burwell, *en route* for Ashe's Inlet, on the north side of Hudson's Strait. We did not get entirely clear from the ice until August 11. About five A. M., on the following day, we arrived opposite Ashe's Inlet, and found the ice tightly jammed along the shore, making a belt about ten miles wide. We attempted to steam through it and all went well until about noon, when one blade of the propeller was broken off and we lay to in order to fit on another. Fortunately, we had two spare fans for this purpose.

The following day opened dull, foggy, and disagreeable. About two P. M. the fog lifted and the ice began to run abroad. We found that

the ship had been carried about thirty miles to the westward of Ashe's Inlet, and we were obliged to retrace our course.

About five p. m., of this day, the ice having closed in again, some Eskimos were seen walking over the frozen surface to the ship. The party consisted of four men and one woman, the latter carrying a baby in the hood of her dress. They were all hoisted on board by ropes, the poor creatures seeming to have perfect confidence in our good intentions. They had small bundles of skins and curiosities for trade and, soon after they came on board, bartering began. They had rather a pitiful supply of seal skins, walrus ivory and a few seal skin boots. The prices for these articles were a plug of black strap tobacco, or some powder, or some percussion caps.

The Eskimo woman, in spite of the burden on her back, seemed quite able to keep up with the men in coming over the ice. Her infant, apparently about a year and a half old, was entirely nude, and was thrust into the seal-skin hood on its mother's back. The poor little wretch was blubbering away with cold and fright. Its head only could be seen peeping over the mother's shoulder. It was a most grotesque little face. It indicated a paternity not Eskimo, its hair being of a light color. One could imagine that that portion of its organism derived from its white father was crying out against such heroic treatment as it was then undergoing, while that portion derived from its mother was trying to conquer such effeminacy.

The struggle of races was going on in the little body, and expressing itself in the disturbed and wailing face. While its plump little body was covered, by nature, with a good layer of blubber to keep out the cold, its face was covered with another kind of blubber as a protest against the frigidity of the air.

The mother and the men seemed happy, cheerful and, like children, were fully impressed with the novelty of every thing on board the ship.

At night they were all sent up to the fore-castle to sleep. The baby was a great source of amusement to the sailors. One of them wrapped the little thing up in a warm flannel shirt before it went to sleep for the night.

One's heart goes out in pity to these poor people, whose lives are passed in such inhospitable regions in a constant struggle against all the adverse forces of nature. Yet they seem happy and contented. Fortunately, their heroic method of bringing up the children weeds out, in early infancy, all the weakly ones.

As they have no farinaceous food, the mothers nurse their children until the latter are five, and sometimes six, years old. The men, women

and children are all inordinately fond of tobacco, and it is no unusual thing to see a child, after partaking of nourishment at its mother's breast, reach up and take the pipe from her mouth, and smoke it with all the apparent satisfaction of a true devotee of the soothing weed.

After spending several days in trying to get through the ice into Ashe's Inlet we abandoned the attempt, and steamed across the Strait to Stupart's Bay, where we came to anchor on the morning of August 22.

The Bay is a very picturesque one, with bold, mountainous shores, and several islands scattered about. A number of Eskimo tents were to be seen along the beach, while the station-house, sheds and magnetic observatory were at the head of the Bay.

Soon after coming to anchor, an Eskimo came out in his kayak and made signs that he wished to see the Captain, and handed him a package from Mr. Stupart, the officer who had been left in charge. This contained a letter giving the astounding intelligence, that Mr. Stupart and his three men had abandoned their station several days before our arrival, and had set out on a perilous journey of over 300 miles, in an open boat, for Ft. Chimo, at the foot of Ungava Bay. The letter stated that the winter had been a very severe one, and that many of the natives had starved. Thirteen of them died of starvation almost at the door of the station building. Mr. Stupart had given them more provisions than he could afford, and a like fate seemed to be in store for his little party. Our ship should have arrived a month earlier than it did under ordinary circumstances.

Mr. Stupart feared that she had gone to the bottom. He, therefore, decided that his only course was to attempt to reach Fort Chimo, one of the Hudson Bay Company's trading posts, whence he could go on one of their vessels either to England or to Newfoundland. I am happy to be able to state that Mr. Stupart and his party reached their respective homes in safety.

Soon after coming to anchor in Stupart's Bay a most singular looking object was seen approaching the ship. It proved to be an oomiak, or women's boat — a large open boat made of seal-skin — and was filled with women and children. I counted thirty-eight people in this frail craft. Each individual was in a state of tremendous and audible excitement, yelling, gesticulating, and pushing for a good point of view, while two divided their attention between paddling and adding to the general pandemonium. It looked like Bedlam let loose, or a floating lunatic asylum which had lost its keeper.

As they neared the ship, their excitement increased and we could

distinguish their yells "Chimo! chimo! tobaccamick! matchamick!" which meant "Welcome! give us tobacco! give us matches!" thus showing that their welcome was not altogether disinterested.

When they came alongside the ship, I threw a few plugs of tobacco into the yelling crowd. In their frantic struggles to get the tobacco, they nearly upset the old tub of a boat.

At this point, the first officer of the ship, fearing that this wild crowd would invade our floating home, jumped upon the bulwarks, with a huge stick of wood in his hand. With a number of forcible and violent Anglo-Saxon expressions, which a sailor always knows how to use, accompanied by menacing gestures with the billet of wood, he persuaded these lovely women to move away from the ship. It is the only instance I have seen, where a sailor was ungallant to the fair sex.

We saw at various times, during our cruise, considerable numbers of the Eskimos. They interested me greatly, as being types of the human race still pursuing a barbarous and nomadic life, and totally unimproved by civilization or Christianity.

The Eskimos are the most northerly of the American native tribes, residing chiefly above latitude 60° N. The name "Eskimo" was applied to them by the Algonquins, a family of North American Indians, and means literally, "eaters of raw meat." The term is well applied, for I have never known them to cook their meat, except for the very old people who had lost their teeth. They appear to show great kindness and deference to the aged and are, in this respect, a pleasing contrast to our wild Indian tribes.

Most ethnologists class the Eskimos with the Mongolians. Their physical characteristics give strong support to this theory. Their ingenuity, their intelligence, far superior to that of most wild tribes, their skill and cunning with their hands, all furnish reasonable grounds for this theory.

I have here a little carving made from a walrus tusk by one of these savages, his only implements being a file and an old nail. It represents an Eskimo in a kayak, or skin boat for hunting, with paddle, harpoon, gaff, etc., complete. It is a perfect miniature of what it represents. The proportions are exact, there is not a line out of drawing, and it shows a great degree of intelligence and of the art instinct, remarkable in a savage who has lived in such an unfavorable environment. It would indicate to me, quite as much as physical appearance, that the origin of this people was Mongolian.

We have all seen the ivory carvings of the Chinese, and I leave you to judge if you cannot trace a resemblance between the work of

this rude barbarian and that of their more cultured and enlightened relatives of the Orient.

I have also a model of their kayak, made of seal-skin, the same material which they use in their large boats. Except for its size, it is exactly what they would use in going out hunting for seals or walrus. You will observe that there is not a particle of metal in it. Its components are seal-skin, wood and sinews probably of the caribou.

The Eskimos are very reticent about their religious beliefs. They seem to believe in a future existence, after death. Formerly, in burying the dead, if the deceased had been a hunter, their custom was to bury with the body, a gun, knife and other implements of the chase, for use in the happy hunting grounds. Now they do not do so. When asked why, they said, it is no longer necessary, that the Great Spirit has restocked the hunting grounds of the spirit world with game, and that the latter is now so plentiful and so devoid of pugnacity, that all which is needed to kill it is a club. The truth probably is, that guns are more valuable now than formerly and they do not wish to waste them.

In this respect they modify their religious views to suit circumstances with as much ingenuity as some of their more enlightened fellow-beings of civilized countries. A sliding-scale in religion is sometimes as convenient as it is in trade.

I spoke of their burying the dead. Of course in that region, where what little soil there is, is permanently frozen a little below the surface, they cannot dig graves. The dead are laid out on the rocks, and boulders and stones piled around and over them.

The Eskimos are rather well versed in astronomy. They have grouped the stars into constellations and have named the latter after objects with which they are familiar. They know the peculiarities of the pole-star and call it Nicky-chew-ē-too, "the star which does not move." The Pleiades they call Secky-ē-cha, "the breast-bone of the reindeer." The Dipper, or Ursa Major, they call Took-took-dew, "the reindeer."

The limits of this paper will not permit me to say more about these people. With their manner of living, their ordinary habits and physical characteristics, you are probably already familiar, from what you have read in books on arctic travel.

From Stupart's Bay, we went to the westward to Nottingham and Digges Islands, and relieved the men in charge of those stations.

In addition to the difficulties arising from the ice in the Strait, the total lack of light-houses and reliable charts, there are other obstacles to navigation, chief of which is the unreliability of the ordinary mag-

netic compass. At the western end of the Strait it becomes so sluggish as to be almost useless. The Sir Wm. Thomson card was used by Captain Gordon, and was found to work admirably when properly compensated.

The reason of the difficulty with the compass is, that from the proximity to the magnetic pole, the horizontal directive force of the earth's magnetism, which alone directly affects the compass needle, is very small compared with the whole magnetic force; consequently, the effects of induced magnetism in the iron of the ship on the compass needle becomes very large in comparison with the direct action above mentioned; the result being, that in an imperfectly compensated compass, the error due to local attraction is very greatly increased.

The means of correcting this error in the Sir Wm. Thomson binnacle are perfect and easily mastered, and the system is such that the compass can, after the first voyage or two, be perfectly compensated by using certain proportions of soft iron bars and magnets, as correctors, the proportion having to be determined by actual observation and experiment on the voyage. Of course, in that region no opportunity should be lost of taking azimuth observations, both stellar and solar.

Our last stopping-place, previous to crossing Hudson's Bay, was at the Digges Islands at the extreme western end of Hudson's Strait. Here we remained several days for the purpose of taking on ballast, testing the chronometers and making a survey of the islands, which had never before been surveyed.

The general appearance of the landscape of these islands is similar to most of the country around Hudson's Strait, presenting bold, rocky shores utterly devoid of vegetation, except moss, lichens, stunted willow-bushes, small plants and grass in the lower valleys. This whole region is desolate-looking in the extreme. I was often amazed to see the amount of animal life in existence there, and wondered how it all managed to find sustenance.

The rocks of Digges Islands are mainly Laurentian gneiss. The bare hills of which they are composed are divided into several detached groups by straight, transverse valleys, cutting well down toward the sea-level, thus giving the appearance of separate islands, when viewed from a distance. The greatest length of the islands lies about east and west (true). As this is also the commonest direction of the strike of the gneiss, most of which is red, and also of the glacial striæ, the islands have become divided by longitudinal valleys, some of which, too, were traced in nearly straight courses for several miles.

It was learned by a survey which we made that there are two of these

islands. On the morning of August 26, a party of us left the ship at 6:30 A. M. in the steam launch to make a track survey of these islands. Dr. Bell was in command. In addition were Messrs. Laperrière—the officer in charge at Digges—Tyrrell, myself, the engineer of the launch and one of the sailors.

It was a cold, blustering day. The sea was running high, so much so that when we got into the tide rips, we shipped large quantities of water. Before we had been out an hour, one of our party, not myself I am happy to say, became very sea-sick and "subsequent proceedings interested him no more."

After we had been out about three hours, and the work was becoming monotonous, the sailor in the bow of the launch called out that there were a couple of polar bears in the water between us and the shore. Let me say here that these animals live in the water more than they do on shore, and have been seen a hundred miles from land, swimming about in apparent unconcern. On account of their amphibious habits they have received the name, *Ursus Maritimus*.

On this day I had the only rifle on board the launch and merely a few cartridges, as I had not expected to see any game. As soon as our party caught sight of the bears, the launch was headed for them. As we approached, we saw they were a large female bear and a young cub. When within range, I fired several shots, but the launch was pitching about to such an extent in the rough water that it was impossible to shoot with any accuracy and I did not hit either of them. The little cub was very much alarmed at the firing and poked its nose inquiringly in its mother's face to know what it all meant. The old dame, however, had more serious business on hand than answering questions, and roughly shoved her child away with her paws. When within about fifty feet of the pair, and just as I was in the act of firing, the old bear made a sudden dive, disappeared, and then came up under the counter of the launch, and caught the gunwale with her jaws and one paw, within about two feet of where Mr. Laperrière was sitting. The rapidity with which he vacated his seat was astonishing. Had we not been going at considerable speed, five knots, the bear would undoubtedly have got into the boat, but, as it was, she could not retain her hold and dropped astern.

By the time we had recovered from our astonishment at the plucky act of Mrs. Bruin, and had turned the launch about, she and her cub were near a rocky promontory which jutted out from the shore, and were soon on the rocks, whence they disappeared over the hill.

After they had disappeared, we ran into a little bay to get fresh

water for the boiler. As we were coming out and rounding a high rocky cape, we saw again two polar bears swimming. At first I thought them the same pair which we had first seen, but soon made out that they were two full-grown animals. As my ammunition was pretty well exhausted, I did not fire until I got within easy range. I fired two shots, wounding one of the beasts. They immediately made for the shore, ran up through a little ravine where they were out of sight, and then appeared on a ledge above. I fired two more shots and wounded both animals. They then started to climb up the cape, but, finding it too steep, fell back and turned down into the ravine or gully, where we could not see them.

The launch was run ashore and the sailor, a bold, courageous man, from Newfoundland, known as "Con" Griffen, and myself got out. Griffen's only weapons were a boat-hook and an axe. We climbed up the rocks, so as to get a good point of attack above the bears. For some time we could not see them, but heard them growling with pain and rage. I must confess that I resembled at that moment Bob Acres, in "The Rivals," and could feel the courage gradually oozing out from my finger ends. But it was worse to go back and be laughed at for showing the white feather, so I kept on. We approached within about fifty feet of the bears before they were visible. As soon as they caught sight of us they began to growl and roar worse than ever. I immediately fired two shots from my Remington rifle, which is a single-fire breech-loader. Both took effect in the body of one animal. In order to get a better aim, the bears being a little below the ledge where we were, and among the rocks, Griffen and I went nearer. I fired at the other bear, which was very slightly hurt, and hit him in the body, but it only enraged him the more. He immediately gave a most terrific roar of pain and sprang at us; fortunately, he was obliged to come up hill. By the time I had extracted the old shell and had reloaded my rifle, he was within ten feet of me. I fired as carefully as I could; the ball struck him in the lower jaw and then entered his head. He fell back into the gully, turned tail, crawled down to the water's edge and plunged into the sea, where he died soon after. By this time my last cartridge had been fired. "Con" Griffen all this time had stood just at my right, with axe uplifted, ready to take a hand in the fight whenever necessary.

As we did not wish to go back without some trophy, we decided to attack the remaining bear, which was very badly wounded, with the axe and the boat-hook. In this way we killed it. The party from the launch soon after came ashore, and all turned to and helped skin

the bear. We then proceeded with our survey of the Digges Islands, and returned to the ship about six P. M.

The places which we visited at various times on our cruise constitute a sportsman's paradise. Of large animals there are, besides the bears, cariboo, or reindeer, in great numbers, and walrus and seals by the hundreds. Of birds there are the beautiful ptarmigan, various species of ducks, murre, sea-pigeons, geese, swans, and curlews; of fishes, according to locality, cod, sea-trout, speckled trout, salmon, grayling and white-fish.

From Digges Islands we sailed across Hudson's Bay to Ft. Churchill, one of the large posts of the Hudson's Bay Company. Near this post are the well-preserved ruins of old Fort Prince of Wales, which was captured by the famous French Admiral, Lapérouse, in the last century, its guns spiked and its walls partly destroyed.

From Fort Churchill we returned over the same route, revisited the various stations, and thence proceeded to Halifax, where we landed on a bright, sunny Sabbath morning, the 18th of October.

I will now give some of the results of our work. Of course I can give you only a few general facts as pertaining to the main objects of our cruise. An almost indefinite number of papers might be written as to the geology, zoölogy, entomology, botany, meteorology and all the other ologies of that region. Of these I will not attempt to speak.

"Hudson's Bay, situated between 51° and 63° of north latitude, is a vast sheet of salt water, measuring 1,300 miles in length with an average of about 600 miles in width. It is more properly a sea, having an area of over 500,000 square miles, or considerably more than one-half the area of the Mediterranean. It has aptly been called the Mediterranean of this continent.

"It drains an expanse of country spreading out more than 2,000 miles from east to west and 1,500 from north to south, or an area of 3,000,000 square miles."* It lies entirely south of the Arctic Circle, and its southern extremity is about the latitude of London. Its waters are never frozen, except near the shores; it is navigable the entire year. In the summer months its waters are warmer than those of Lake Superior, the temperature of the water sometimes rising as high as 59° Fahr., and people bathe in it with comfort. Hudson's Strait, which is the gateway to this vast sheet of water, is about 500 miles in length, with an average width of 100 miles. The narrowest part is about the center, and at the outlet into the Atlantic, where the breadth is only about 45 miles. The depth of water in the Strait, so far as

* Popular Science Monthly, June, 1885.

it has been sounded, varies from 100 to 340 fathoms. In the Bay there is an almost uniform depth of 70 fathoms.

* "It will be seen by an inspection of the chart, that Fox's Channel, in respect to width, general direction, etc., is a continuation of Hudson's Strait, and that the outlet of Hudson's Bay joins this great channel at right angles. It is much deeper than Hudson's Bay, the comparative shallowness and the uniformity of the bottom of which are remarkable features. If the sea in these latitudes were only about one hundred fathoms lower than it is at the present time, James' and Hudson's Bays would become dry land, while the Strait would remain as a long bay, but with a slightly diminished breadth. The bottom of the Bay would have become a plain, more level in proportion to its extent than any other on the continent. The numerous rivers which now flow into it would traverse this plain, converging toward the north-east and falling into the Strait near Cape Wolstenholme, after having, perhaps, formed one immense river, flowing northward down the center of the Bay, or probably nearer the east-main side.

During the "great ice age" the basin of Hudson's Bay may have formed a sort of glacial reservoir, receiving streams of ice from the east, north and north-west, and giving forth the accumulated result as broad glaciers, mainly toward the south and south-west. The direction of the glaciation, on both sides of Hudson's Strait, was eastward. That an extensive glacier passed down the Strait may be inferred from the smoothed and striated character of the rocks of the lower levels, the outline of the glaciated surfaces pointing to an eastward movement, the composition of the drift, and also from the fact that the long depression of Fox's Channel and the Strait runs from the north-westward toward the south-east, and that this great channel or submerged valley deepens as it goes, terminating in the Atlantic Ocean. Glaciers are said to exist on the shores of Fox's Channel and they may send down the flat-topped icebergs which float eastward through the lower part of Hudson's Strait into the Atlantic. During the drift period, the glacier of the bed of Hudson's Strait was probably joined by a contribution from the ice which appears to have occupied the site of Hudson's Bay, and by another also from the southward, coming down the valley of the Koksok River, and its continuation in the bottom of Ungava Bay. The united glacier still moved eastward round Cape Chudleigh into the Atlantic.

Throughout the drift period, the top of the coast range of the Labrador stood above the ice and was not glaciated, especially the high

* Report of Dr. Robert Bell, F.R.S., 1884.

northern part. Further south on this coast, the range is lower and there may also have been more ice in this direction. Here the valleys and the hills, up to the height of one thousand feet, at any rate, have been planed by glacial action, the course followed by the ice on the eastern slope having been down the valleys and fjords directly into the sea. In the southern part of the Labrador peninsula, the general course of the ancient glaciation appears to have been southward, varying to the eastward or westward with the courses of the rivers and valleys, and coming to the north shore of the Gulf of St. Lawrence, in a general way, at right angles to the coast line. On the island of Newfoundland, the glaciation appears to have been from the center toward the sea on all sides."

In the vast region, included in the water-shed of Hudson's Bay and Hudson's Strait, there are boundless stores of wealth awaiting the magic wand of enterprise, pluck and capital.

In the country south and south-west of the Bay are untrodden forests, which will one day be an important factor in the lumber supply of the world. The varieties of wood found there are white and red pine, cedar, spruce, tamarack and the Banksian pine; and I am informed that the trees grow to a good size.

In many places on the shores of Hudson's Bay and Strait, valuable economic minerals are found in good deposits. These comprise gold, silver, lead, copper, several kinds of iron ore, including the valuable manganiferous variety, asbestos, pyrites, and a great variety of coarser mineral products and ornamental stones.

The value and importance of these mineral deposits can only be determined by further search, but they are undoubtedly great.

The waters of the Bay and Strait and the inflowing streams abound in marine mammalia and fishes. Between the extremes of the scale, the huge whale and the tiny capelin, myriads of seals, white porpoises, walrus, cod, salmon, sea-trout, speckled trout, white-fish, grayling and other fishes swim undisturbed by the fisherman or hunter. Occasionally that rare creature, the narwhal, the unicorn of the sea, is found.

In the north-western part of the Bay, the whale-fishery is carried on to a limited extent by the enterprising whalers from New Bedford and New London. It has been officially stated that the returns from this source during the years 1863, 1864, 1865, and 1866, were about \$1,000,000 worth of whale-oil and whale-bone, and this was the product of only four or five comparatively small whaling barques and schooners.

The white porpoise, though not very large, yields the best of oil, yielding on an average a barrel of oil to each one. At one of the

Hudson's Bay Company's posts they caught in one year as many as 2,800 porpoises, by a very inexpensive method.

The walrus are now valuable for oil, ivory and the hides. A full grown walrus represents a monetary value of over \$150. I have seen seventy or eighty of these huge beasts swimming about in close proximity, and must confess that I looked with some regret at about \$12,000 floating away.

Of the value of the cod, salmon and trout fisheries it is not necessary to say much. They will in the future prove to be of great value. The opportunities which this region under discussion affords to the fur-trader have been proved by the history of the Hudson's Bay Company, which in the past has been chiefly a fur-trading corporation.

The valuable black fox is frequently captured, whose skin is worth from \$100 to \$300 in the London market. The silver, the grey, the red and the white foxes are very numerous; hundreds of polar-bear skins, musk-ox robes, carcajou pelts, reindeer skins, wolf-skins, hides of the square-flipper and hood seals, and other articles of barter are obtained annually from the Eskimos and Indians, for prices varying from a \$3 gun, or a little ammunition, to a few plugs of black strap tobacco, worth about three cents a plug.

Having glanced hastily at some of the resources of that region, we come now to the question of the practicability of the Hudson's Bay route. This is a question which I cannot with propriety discuss here, as the complete reports of the officers of our expedition have not yet been given to the public.

I will make only a few remarks and give some facts which have already been published.

The only troublesome part of this route for navigation is in Hudson's Strait and the entrance to it from the Atlantic. There is little doubt that from three to four months can be relied upon for navigation each year for properly-constructed steamers: For the rest of the year, as a rule, the door to Hudson's Bay is locked with a key of ice. Whether that length of time is sufficient for purposes of commerce or not, I do not pretend to say. Some good judges say it is.

From the time of Hudson's first trip into the Bay up to 1882, seven hundred and thirty round voyages had been made. The Hudson's Bay Company formerly insured their ships at as low a rate as would have obtained if they had cleared for Quebec or Montreal. Now, I am informed, they do not insure them at all, as their losses have been few and far between. No vessel, I believe, has ever been lost in Hudson's Strait. Bear in mind that all these voyages were made in sailing

vessels. The "Alert" was the second and last steamer to plow the waters of Hudson's Bay.

To what extent artificial aids might improve that navigation is now a problem. Undoubtedly correct charts of that region, light-houses, buoys, telegraph stations, to signal ships where open water might be found, etc., would improve it very greatly.

To illustrate how carefully we should form an opinion in the matter, I would state that in 1716, Captain Vautrou wrote, that of all known countries, the navigation of the Gulf of St. Lawrence was the most difficult and the most treacherous. Of three expeditions fitted out by England to seize upon New France, and sailing through the Gulf of St. Lawrence, only two were able to cast anchor in the harbor of Quebec. Only one voyage each year was made, and it was alleged that the St. Lawrence River was frozen solid in winter. What a contrast between the navigation then and now. Much of the change has been wrought through artificial aids to navigation, including, of course, improved motive power.

Yet, in the very year that Captain Vautrou condemned the Gulf of St. Lawrence as the navigator's *bête noire*, the Hudson's Bay Company's sailing vessels were threading their devious way in and out of Hudson's Bay.

What seems chimerical and utopian to-day, is a common occurrence to-morrow. The man who proposes any new and strange project, if successful, is regarded by the world as a genius, otherwise, a fool.

The wise men of England were demonstrating the utter impossibility of running a train of cars by steam power, on the very day that George Stephenson hauled a very substantial and material train on his tramway by means of his little locomotive.

Wise men proved conclusively that a ship could not be propelled by steam across the Atlantic, while the first ocean steamer was ploughing her way across.

It seems to me that we should form an opinion with great care and deliberation as to the practicability of this Hudson's Bay route. It is still an open question. Many able and impartial men advocate it; many others oppose it as being utterly impracticable. Others, again, render their verdict in the convenient and old-fashioned Scotch style, "Not proven."

